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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/343,093	06/30/1999	SHOSHI KATAYAMA	862.2907	7483

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EXAMINER

STOCK JR, GORDON J

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/343,093

Applicant(s)

KATAYAMA, SHOSHI

Examiner

Gordon J Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 27-50** are rejected under 35 U.S.C. 102(b) as being anticipated by **Nishi (5,243,195)**.

As for **claims 27, 29, 30, 35, 47, and 50** Nishi in a projection exposure apparatus discloses the following: two image sensing systems as first measurement systems, an off axis alignment system with two ccd cameras for sensing mark images on the wafer stage and a TTR system to sense images of reticle marks comprising two ccd cameras; measurement systems as second measurement systems comprising a plurality of interferometric systems: one set of interferometric systems to measure the reticle stage at a plurality of points, and another to measure the wafer stage at a plurality of points with an arithmetic system comprising a main control system; whereas, the measurement system measures while the image sensing system accumulates data at substantially the same time and senses the image while the stage is moving and suggesting that the stage is moved at a constant speed for smooth scanning to guarantee coordination of values (Figs. 2, 7, 10, 24; col. 3, lines 5-65; col. 4, lines 30-50; col. 11, lines 1-20; col. 15, line 35-55; col. 18, lines 20-35; col. 25, lines 34-50);

As for **claim 28**, see **claim 27** above. In addition, the off axis system obtains average positions (col. 16, lines 1-20).

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As for **claim 31**, see **claim 27** above. In addition, the image sensing system is an off axis alignment system (Fig. 10).

As for **claim 32**, see **claim 27** above. In addition, the measurement system is an interferometer system (Fig. 2: IRX, IRY, IFX, IFY2, IFY1).

As for **claim 33**, see **claim 27** above. In addition, Nishi discloses the object has a plurality of areas, fiducial plate and the wafer; whereas, the positions of the plurality of areas are found such as per shot region (Figs. 9 and 18; col. 29, lines 35-50);.

As for **claim 34**, see **claim 33** above. In addition, Nishi discloses calculating positional deviations are calculated for the marks in relation to multiple areas such as subsets comprising shot areas (Figs. 17-19; 25-26; col. 29, lines 35-60).

As for **claims 36, 38, 39, 44, and 48** Nishi discloses the following: an exposure apparatus having a wafer stage (Fig. 2: WST); a lens section (PL); a positioning system and calculation section, a stage driver with main control system for calculating positions (Fig. 24); a first measurement system which has an image sensor and measures a position of a mark formed on the substrate, an off axis alignment system (Fig. 10); a second measurement system, an interferometric system for measuring the stage a plurality of times; whereas, the stage position measurement system measures while the image sensing system, the first measurement system, accumulates data at substantially the same time and senses the image while the stage is moving, and suggests that the stage is moved at a constant speed for smooth scanning to guarantee coordination of values (Figs. 2, 10, 24; col. 3, lines 5-65; col. 4, lines 30-50; col. 11, col. 15, line 35-55; col. 18, lines 20-35; col. 25, lines 34-50).

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As for **claim 37**, see **claim 36** above. In addition, Nishi discloses storing image signals and obtaining an average position with the off axis system (col. 16, lines 1-20).

As for **claim 40**, see **claim 36** above. In addition, the image sensing system is an off axis alignment system (Fig. 10).

As for **claim 41**, see **claim 36** above. In addition, the measurement system is an interferometer system (Fig. 2: IFX, IFY2, IFY1).

As for **claims 42 and 43**, see **claim 36** above. In addition, Nishi discloses the object has a plurality of areas, fiducial plate and the wafer; whereas, the positions of the plurality of areas are found such as per shot region (Figs. 9 and 18; col. 29, lines 35-50). In addition, Nishi discloses calculating positional deviations are calculated for the marks in relation to multiple areas such as subsets comprising shot areas (Figs. 17-19; 25-26; col. 29, lines 35-60).

As for **claims 45 and 46**, see **claim 36** above. In addition, Nishi discloses: as for a determination system: the main control system suggests a determining system for controlling everything and providing such modes as checking rotational error, Abbe error determination, rough and fine alignment modes (cols. 18-20); whereas, the system exposes a pattern on the wafer from the reticle after alignment and positioning is done (col. 2, lines 60-67; col. 6, lines 60-67; col. 7, lines 1-15).

As for **claim 49**, Nishi discloses the following: placing a substrate applied with a resist, a wafer on the stage (Fig. 2: W; col. 12, lines 10-15; first measuring a position of a mark formed on the substrate based on image data that is obtained during a period of time and second measuring a position of the stage a plurality of times during accumulation period; calculating the position of the mark based on the measurements; aligning the substrate using the stage of the

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exposure apparatus (Figs. 2, 10, 24; col. 3, lines 5-65; col. 4, lines 30-50; col. 11, col. 15, line 35-55; col. 18, lines 20-35; col. 25, lines 34-50); and transferring a pattern to the substrate using a projection lens (col. 2, lines 60-67; col. 6, lines 60-67; col. 7, lines 1-15).

Response to Arguments

3. Applicant's arguments filed September 3, 2004 have been fully considered but they are not persuasive. Specifically, the argument concerning the TTL of Nishi comprising a photomultiplier is not persuasive, for though the TTL does not comprise an imaging sensor, the off axis alignment system does (col. 15, lines 20-45) and this off axis system measures marks in shot regions (col. 29, lines 35-45). In addition, claims 27, 47, and 50 as written do not preclude a reticle based alignment system such as with the reticle stage, reticle stage interferometric system, and TTR imaging system of Nishi, for the claims state 'a mark on an object' and 'a mark formed on an object' which does not preclude a reticle mark on a reticle.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR, 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and

2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gs

November 13, 2004



Zandra V. Smith
Primary Examiner
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